

Claims:

1. A hinge device for pivotally coupling a display to a base of an electronic device, the hinge device comprising:

a seat adapted to be secured with the base, the seat defining a hole therein, a railway defined in an inner wall of the seat;

a rotor adapted to be secured with the display, the rotor comprising a shaft pivotally received in the hole of the seat and a beam fixed with the display;

and

at least one roller located on the rotor and movably received in the railway of the seat;

wherein when the shaft of the rotor rotates in the hole of the seat, the at least one roller moves along the railway to cause the rotor to move in an axial direction of the shaft.
2. The hinge device as described in claim 1, wherein the seat comprises a block and a plurality of connecting tabs extending outwardly from a circumferential wall thereof, each of the tabs defines a securing hole therein, and the block forms a rear planar wall.
3. The hinge device as described in claim 2, wherein a locating hole is defined through the seat and the block, the locating hole engagingly receives a locator, the locator comprises a cup, a spring and a ball, the spring abuts against an inside bottom of the cup, and the ball abuts against an outmost end of spring.
4. The hinge device as described in claim 3, wherein the locating hole is threaded, and the cup has an outer thread.
5. The hinge device as described in claim 3, wherein the shaft of the rotor defines a plurality of vertical parallel flutes in an outer wall thereof, and the ball of the

locator engages in respective flutes to locate the rotor in discrete positions as the rotor is rotated in the seat.

6. The hinge device as described in claim 5, wherein the shaft defines at least one socket accommodating the at least one roller.
7. The hinge device as described in claim 1, wherein the beams connects with a pair of second hinges, each of the second hinges comprises a first rotating member and a second rotating member pivotally engaged with the first rotating member, the second rotating member is attached to the display, and the first rotating member is attached to a respective beam of the rotor.
8. The hinge device as described in claim 2, wherein the railway has a generally sinusoidal path and traces two complete cycles.
9. The hinge device as described in claim 8, wherein an imaginary line between crest points of the railway is perpendicular to the rear wall of the block, and an imaginary line between trough points of the railway is parallel to the rear wall of the block.
10. The hinge device as described in claim 9, wherein the seat further defines a vertical guide channel in an inner wall thereof in communication with the railway for facilitating entry of the at least one roller into the railway.
11. A hinge device assembly comprising:
 - a base; and
 - a hinge device for coupling a display to a base, the hinge device comprising:
 - a pair of first hinges each comprising a first rotating member and a second rotating member pivotally engaging with the first rotating member, the second rotating member being secured in the display; and
 - a second hinge comprising a seat engaged with the base and a rotor engaged with the first member, the seat pivotally engaged with the rotor;

wherein when the display rotates relative to the base in a direction parallel to the base, the rotor is moved in a direction perpendicular to the base thereby driving the display to move in said direction perpendicular to the base.

12. The hinge device assembly as described in claim 11, wherein the seat defines a central through hole therein and the rotor comprises a shaft rotatably received in the through hole.
13. The hinge device assembly as described in claim 12, wherein the seat comprises a block extending from an outer circumferential wall thereof, a locating hole is defined through the seat and the block, and a locator is received in the locating hole.
14. The hinge device assembly as described in claim 13, wherein the locator comprises a cup, a spring and a ball, the spring abuts against an inside bottom of the cup, the ball abuts against an outmost end of spring, and the shaft of rotor defines a plurality of vertical parallel flutes in an outer wall thereof, the ball of the locator engaging in respective flutes to locate the rotor during rotation of the rotor in the seat.
15. The hinge device assembly as described in claim 14, wherein the locating hole is threaded, and the cup has an outer thread.
16. The hinge device assembly as described in claim 11, wherein the rotor comprise a pair of beams attached to the second rotating members of the first hinges respectively.
17. The hinge device assembly as described in claim 11, wherein the shaft defines at least one socket in an outer wall thereof accommodating at least one roller, the at least one roller being tightly and movably held between the socket and railway.
18. The hinge device assembly as described in claim 17, wherein the railway has

a generally sinusoidal path and traces two complete cycles, an imaginary line between crest points of the railway is perpendicular to the rear wall of the block, and an imaginary line between trough points of the railway is parallel to the rear wall of the block.

19. The hinge device assembly as described in claim 17, wherein a vertical guide channel is defined in the inner wall of the seat in communication with the railway.

20. A hinge device assembly comprising:

a seat secured with a first part, the seat defining a first engagement device defining an vertical axis and a first guiding device thereof;

a rotor secured with a second part, the rotor comprising a second engagement device defining along said vertical axis and engaged with said first engagement device along said vertical axis, and thereof a second guiding device guidably engaged with the first guiding device; wherein

the rotor is rotatable relative to the seat about said vertical axis under a condition that during rotation said rotor is forced to move up and down along said vertical axis due to engagement between said first and second guiding device so as not to have third and fourth part interfere with each other wherein said third part is attached to the first part and said fourth part is attached to the second part.

21. The hinge device assembly as defined in claim 20, wherein either a subassembly of said first part and said third part, or another assembly of said second part and said fourth part is self-rotatable along a horizontal axis.